CHAPTER 4—THE REPAIR/RENOVATION OF S&E RESEARCH FACILITIES

HIGHLIGHTS

- In fiscal years 1996 and 1997, research-performing institutions committed $1.5 billion to the repair/renovation of science and engineering research facilities. This is 22 percent more (in constant dollars) than they committed to new repair/renovation projects in 1994 and 1995 ($1.3 billion) (table 4-1).
- More than half (52 percent) of all research-performing colleges and universities undertook some type of repair/renovation project costing over $100,000 during fiscal years 1996 and 1997 (table 4-5).
- In the current survey period, financial commitments to repair/renovation projects accounted for 33 percent of total capital project expenditures, up from 25 percent in fiscal years 1990 and 1991 (table 4-3).
- Five fields account for more than three quarters (76 percent) of the $1.3 billion committed to the repair/renovation of research facilities costing over $100,000 in 1996 and 1997. These fields are the physical sciences ($244 million), engineering ($208 million), the biological sciences outside medical schools ($200 million), the medical sciences in medical schools ($196 million), and the biological sciences in medical schools ($164 million) (table 4-8).
- For fiscal years 1998 and 1999, research-performing institutions are scheduled to commit $1.6 billion to S&E repair/renovation projects costing more than $100,000 and $983 million to central campus infrastructure repair/ renovation projects costing more than $100,000 (table 4-4).

INTRODUCTION

After years of deferring building repair projects, many of the Nation's colleges and universities have begun pushing aggressively to fund improvements to college facilities.[19] In this chapter, we examine the extent to which research-performing colleges and universities were engaged in the repair/renovation of science and engineering research facilities in 1996 and 1997 and the fields in which this activity occurred.

As was the case for construction in Chapter 3, institutions were asked to estimate the research-related costs and space for repair/renovation projects begun during fiscal years 1996 and 1997, and to make the same estimates for projects scheduled to begin in fiscal years 1998 and 1999. The project start-up time was defined as the fiscal year in which actual work began (or was expected to begin). In the case of projects conducted over multiple years, total project costs were allocated to the fiscal year in which the repair/renovation began. Note, however, that the costs and parameters of multiyear projects can change between the time a project begins and the time it is completed.

The reported financial commitments, defined as the cost to complete a project, included planning, site preparation, fixed equipment, and building infrastructure. Projects costing over $100,000 and those costing between $5,000 and $100,000 were reported separately.

It should be noted that fluctuations in repair/ renovation spending from one year to another can result from large projects at a small number of institutions. Given the costs of repairing/renovating S&E research facilities, a large increase could reflect a big project on one or two campuses. Indeed, this is often the case for the nondoctorate-granting institutions.

This year, for the first time, institutions were asked to report any nonfixed equipment costing $1 million or more that was included as part of their repair/renovation costs for fiscal years 1996 and 1997. If a project were to serve both research and nonresearch purposes, repair/ renovation costs and space estimates were to be prorated to reflect the research-related portion of the cost and space (see Items 4a, 4b, and 4c in Appendix C).

[19] Peter Schmidt. (1998, June 12). A building boom for public colleges. *The Chronicle of Higher Education*, A29-A30.

FINDINGS

FUNDS COMMITTED TO THE REPAIR/ RENOVATION OF S&E RESEARCH FACILITIES

Research-performing institutions committed a total of $1.5 billion to the repair/renovation of science and engineering research facilities in 1996 and 1997. This is 22 percent more (in constant dollars) than they committed to new repair/renovation projects in the last survey period ($1.3 billion).

Between fiscal years 1994 and 1995 and fiscal years 1996 and 1997, doctorate-granting institutions and nondoctorate-granting institutions increased the amount of funds committed to new repair/renovation projects:

- Doctorate-granting institutions committed $166 million or 14 percent more funds;
  - The top 100 institutions committed $78 million or 9 percent more funds; and
- Nondoctorate-granting institutions committed $107 million or 122 percent more funds (table 4-1).

Financial commitments to repair/renovation projects costing over $100,000 constituted 86 percent of all repair/ renovation funds in 1996 and 1997. Funds committed to these types of repair/renovation projects increased by 19 percent since the last survey (from $1,116 million to $1,325 million). Funds for projects costing over $100,000 increased at doctorate-granting institutions and nondoctorate-granting institutions during both of these time periods (figure 4-1):

Table 4-1. Trends in funds committed to repair/renovate science and engineering research facilities by institution type and cost of project: 1986–97

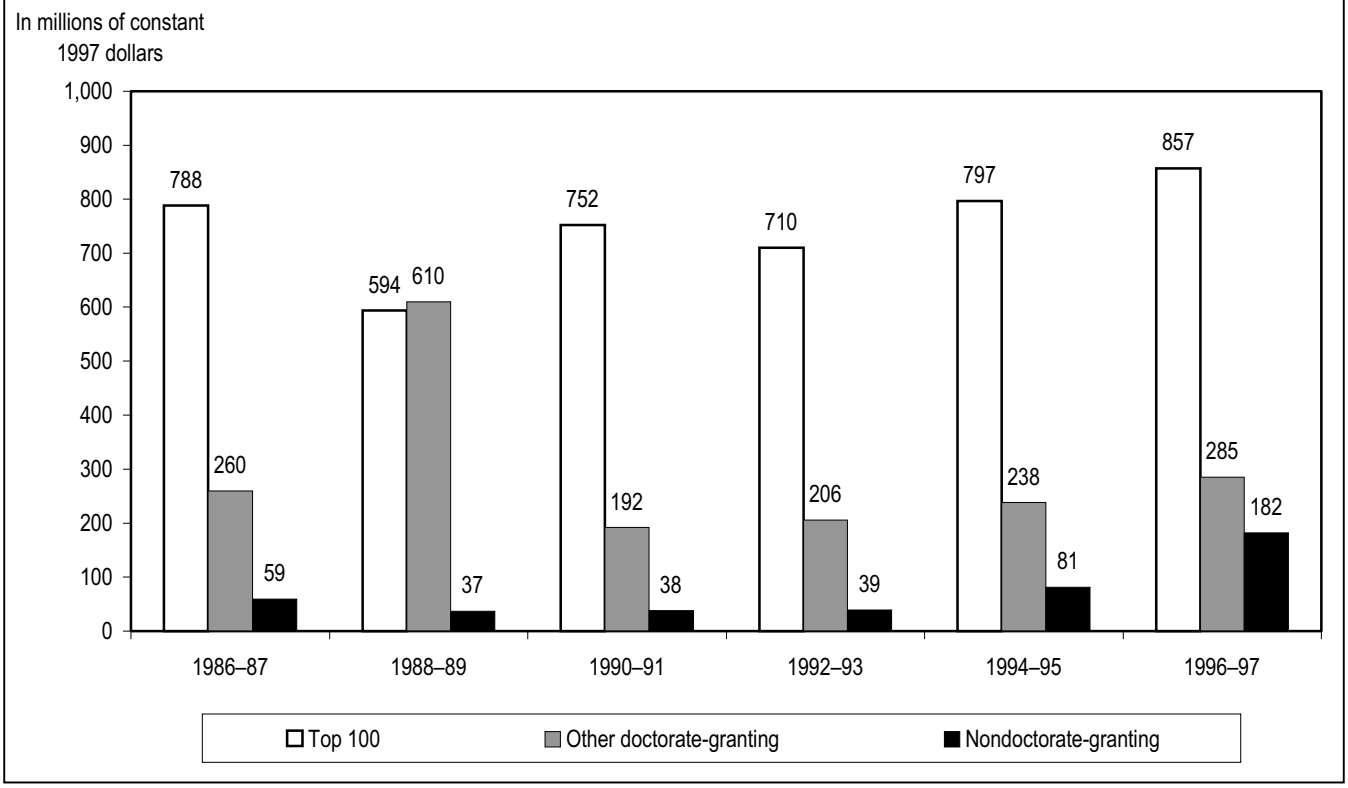
Institution type	1986–87	1988–89	1990–91	1992–93	1994–95	1996–97
	In millions of constant 1997 dollars					
Total						
Total cost	--	--	1,155	1,230	1,259	1,532
Over $100,000	1,108	1,243	982	955	1,116	1,325
Under $100,000	--	--	173	275	142	208
Doctorate-granting						
Total cost	--	--	1,112	1,153	1,171	1,337
Over $100,000	1,048	1,205	944	916	1,035	1,142
Under $100,000	--	--	168	237	136	195
Top 100 in research expenditures						
Total cost	--	--	867	915	904	982
Over $100,000	788	594	752	710	797	857
Under $100,000	--	--	115	205	108	125
Other						
Total cost	--	--	245	238	267	355
Over $100,000	260	610	192	206	238	285
Under $100,000	--	--	53	33	28	70
Nondoctorate-granting						
Total cost	--	--	43	77	88	195
Over $100,000	59	37	38	39	81	182
Under $100,000	--	--	5	38	6	13

KEY: -- = Data were not collected.

NOTE: Components may not add to totals due to rounding. Current dollars have been adjusted to constant 1997 dollars using the Bureau of the Census' Composite Fixed Weighted Price Index for Construction.

SOURCE: National Science Foundation/Division of Science Resources Studies, 1998 Survey of Scientific and Engineering Research Facilities at Colleges and Universities.

Figure 4-1. Trends in funds committed to science and engineering research facilities repair/renovation projects costing more than $100,000 by institution type: 1986–97



NOTE: Components may not add to totals due to rounding. Current dollars have been adjusted to constant 1997 dollars using the Bureau of the Census' Composite Fixed Weighted Price Index for Construction.

SOURCE: National Science Foundation/Division of Science Resources Studies, 1998 Survey of Scientific and Engineering Research Facilities at Colleges and Universities.

- At doctorate-granting institutions, the funds for projects costing over $100,000 increased by $107 million or 10 percent since the last survey (from $1,035 million to $1,142 million);
  - At the top 100 institutions, the funds for these projects increased by $60 million or 8 percent since the last survey (from $797 million to $857 million); and
  - At nondoctorate-granting institutions, the funds for these projects increased by $101 million or 125 percent since the last survey (from $81 million to $182 million).

Total funds committed to new repair/renovation projects costing less than $100,000 increased by 46 percent since the last survey, from $142 million to $208 million. In 1996 and 1997, these less expensive projects accounted for 14 percent of all funds committed to new repair/renovation projects. Since the last survey, all institution types increased their allocations to these kinds of projects (table 4-1):

- Doctorate-granting institutions increased their allocations by $59 million or 43 percent (from $136 million to $195 million);
  - The top 100 institutions increased their allocations by $17 million or 16 percent (from $108 million to $125 million);
  - Other doctorate-granting institutions increased their allocations by $42 million or 150 percent (from $28 million to $70 million); and
- Nondoctorate-granting institutions increased their allocations by $7 million or 117 percent (from $6 million to $13 million).

A subset of 383 research-performing institutions were in both the 1996 and 1998 samples. These institutions actually committed in fiscal years 1996 and 1997 close to the amounts that in the 1996 survey they had estimated they would commit to new repair/renovation projects costing over $100,000; they would start in 1996 and 1998.[20] They were scheduled to commit $1,188 million and actually committed $1,145 million, a difference of $43 million or 4 percent. The doctorate granting institutions committed fewer funds than they had planned:

- Doctorate-granting institutions committed $48 million or 4 percent fewer funds than they had scheduled;
  - The top 100 institutions committed $42 million or 5 percent fewer funds than they had scheduled; and
  - Other doctorate-granting institutions committed $6 million or 3 percent fewer funds than they had scheduled (table 4-2).

Table 4-2. Scheduled and actual repair/renovation commitments for projects costing more than $100,000 for science and engineering research space by institution type: 1996–97

Institution type	Number of institutions	1996–97 (scheduled)	1996–97 (actual)
		In millions of dollars	
Total	383	1,188	1,145
Doctorate-granting	257	1,098	1,050
Top 100 in research expenditures	99	898	856
Other	158	200	194
Nondoctorate-granting	126	89	95

NOTE: Components may not add to totals due to rounding. Includes only institutions in both the 1996 and 1998 samples.

SOURCE: National Science Foundation/Division of Science Resources Studies, 1996 and 1998 Surveys of Scientific and Engineering Research Facilities at Colleges and Universities.

[20] The scheduled 1996–97 data come from National Science Foundation/Division of Science Resources Studies, 1996 Survey of Scientific and Engineering Research Facilities at Colleges and Universities. Because this analysis is limited to the subset of research-performing institutions that were in both the 1996 and 1998 samples, the results do not generalize to the population of research-performing institutions.

Funds Committed to Repair/Renovation Projects as a Proportion of Total Capital Projects

The share of total capital project funds committed to initiate the repair/renovation of S&E research space has risen in each survey period since data were first collected on this topic in 1990–91.[21] In the 1990–91 period, total financial commitments to repair/renovation projects—both under and over $100,000—represented 25 percent of all capital project commitments. In the most recent survey period (1996–97), these commitments grew to 33 percent of all capital projects (table 4-3).

Between 1990–91 and 1996–97, the proportion of funds committed to new repair/renovation projects as a function of total capital projects increased substantially at the following types of institutions:

- Doctorate-granting institutions' proportion of repair/renovation commitments increased from 25 percent of all capital projects to 32 percent;
  - The top 100 institutions' proportion increased from 27 to 32 percent; and
- Nondoctorate-granting institutions' proportion increased from 22 to 42 percent.

Between the last survey period (1994–95) and the current one, the proportion of funds committed to new repair/renovation projects as a function of total capital projects by the nondoctorate-granting institutions increased from 20 to 42 percent. However, the proportion of funds committed by these institutions has fluctuated by roughly 20 percentage points from survey period to survey period.

Funds Scheduled for the Repair/Renovation of S&E Research Facilities and Central Campus Infrastructure

For fiscal years 1998 and 1999, research-performing institutions are scheduled to commit $1.6 billion to S&E repair/renovation projects costing over $100,000. Most of this repair/renovation is scheduled to occur among the doctorate-granting institutions, the top 100 institutions in particular. Doctorate-granting institutions plan to commit 23 percent or $257 million more to new repair/renovation

[21] Trends are reported from the 1990 and 1991 fiscal years because this was the first time period for which institutions reported repair/renovation expenses for projects costing over $100,000 and for projects costing less than $100,000.

Table 4-3. Funds committed to science and engineering repair/renovation as a percentage of total capital project expenditures by institution type: 1990–97

Institution type	Total capital projects	Repair/ renovation	Repair/ renovation as percent of total	Total capital projects	Repair/ renovation	Repair/ renovation as percent of total
	1990–91			1992–93		
	In millions of dollars			In millions of dollars		
Total	4,693	1,155	25	4,437	1,230	28
Doctorate-granting	4,495	1,112	25	4,255	1,153	27
Top 100 in research expenditures	3,271	867	27	3,228	915	28
Other	1,227	245	20	1,027	238	23
Nondoctorate-granting	195	43	22	181	77	42
	1994–95*			1996–97		
Total	4,179	1,259	28	4,644	1,532	33
Doctorate-granting	3,742	1,171	31	4,181	1,337	32
Top 100 in research expenditures	3,022	904	30	3,036	982	32
Other	721	267	37	1,145	355	31
Nondoctorate-granting	437	88	20	463	195	42

*Some 1994–95 values have been revised since the 1996 report.

NOTE: Components may not add to totals due to rounding. Percentages are based on unrounded data that do not appear in the table. Current dollars have been adjusted to constant 1997 dollars using the Bureau of the Census' Composite Fixed-Weighted Price Index for Construction.

SOURCE: National Science Foundation/Division of Science Resources Studies, 1998 Survey of Scientific and Engineering Research Facilities at Colleges and Universities.

projects in fiscal years 1998 and 1999 than they did in 1996 and 1997 (from $1.1 billion to $1.4 billion). Top 100 institutions plan to commit 19 percent or $166 million more (from $857 million to $1,023 million) (tables 4-4 and 4-1).

Research-performing institutions are scheduled to commit $983 million to new central campus infrastructure repair/renovation projects in 1998 and 1999. These funds are distributed among the institution types as follows:

- Doctorate-granting institutions plan to commit $936 million to new central campus infrastructure projects; this represents 95 percent of these funds;
  - The top 100 institutions plan to commit $612 million or 62 percent of these funds;
  - Other doctorate-granting institutions plan to commit $325 million or 33 percent of these funds; and

Table 4-4. Funds scheduled for the repair/renovation of science and engineering (S&E) research facilities and central campus infrastructure by institution type: 1998–99

Institution type	S&E research space	Central campus infrastructure	Total
	Scheduled repair/renovation		
	In millions of dollars		
Total	1,580	983	2,563
Doctorate-granting	1,399	936	2,336
Top 100 in research expenditures	1,023	612	1,635
Other	376	325	700
Nondoctorate-granting	181	46	227

NOTE: Components may not add to totals due to rounding. As used here, repair/renovation projects are limited to those with prorated costs at $100,000 or more for affected research space.

SOURCE: National Science Foundation/Division of Science Resources Studies, 1998 Survey of Scientific and Engineering Research Facilities at Colleges and Universities.

- Nondoctorate-granting institutions plan to commit $46 million or 5 percent of these funds.

Overall, research-performing institutions are scheduled to commit fewer funds to new S&E facilities repair/renovation projects as they are scheduled to commit to new S&E construction projects ($1.6 billion versus $3.9 billion). By contrast, research-performing institutions are scheduled to commit more than twice as much to new central campus infrastructure repair/renovations projects in 1998 and 1999 as they are scheduled to commit to new central campus infrastructure construction projects ($983 million versus $396 million). (See table 3-4 for funds committed to scheduled construction of research facilities and central campus infrastructure.)

Colleges and Universities Starting S&E Repair/Renovation Projects

In 1996 and 1997, slightly over half (52 percent) of all research-performing institutions reported that they initiated repair/renovation projects costing over $100,000 (table 4-5). More institutions started new repair/renovation projects in 1996 and 1997 than started new construction projects (52 percent compared with 30 percent). (See table 3-5 for the proportion of institutions starting construction projects.)

In 1986–87, a higher proportion of doctorate-granting institutions in general, and top 100 institutions in particular, started repair/renovation projects than began them in the current survey period (1996–97), while a lower proportion of other doctorate-granting institutions started new construction projects:

- The proportion of doctorate-granting institutions beginning repair/renovation projects declined from 78 to 67 percent of institutions;
  - The proportion of top 100 institutions declined from 96 to 92 percent of institutions; and
  - The proportion of other doctorate-granting institutions increased from 44 to 58 percent of institutions.

In 1998 and 1999, 46 percent of research-performing institutions are scheduled to start new S&E repair/renovation projects costing over $100,000. This proportion is less than the proportion of institutions that started repair/renovation projects in 1986 and 1987 (56 percent).

A separate analysis of the 383 institutions that were in both the 1996 and 1998 samples reveals that 151 or 79 percent of all research-performing institutions that had scheduled new repair/renovation projects costing over $100,000 for 1996 or 1997 actually undertook them (table 4-6).[22] The top 100 institutions' actions were more consistent with their plans to repair/renovate new S&E research facilities than that of the other types of institutions. Overall, 126 or 86 percent of doctorate-granting institutions acted in accordance with their plans, as did 74 or 96 percent of top 100 institutions and 52 or 74 percent of other doctorate-granting institutions.

[22] Because the analysis is limited to the subset of research-performing institutions that were in both the 1996 and 1998 samples, the results do not generalize to the population of research-performing institutions.

Table 4-5. Trends in the percentage of institutions starting projects to repair/renovate science and engineering research facilities by institution type: 1986–99

Institution type	1986–87	1988–89	1990–91	1992–93	1994–95*	1996–97	(scheduled) 1998–99
Total	56	48	47	45	45	52	46
Doctorate-granting	78	71	74	61	61	67	63
Top 100 in research expenditures	96	85	91	90	88	92	85
Other	44	63	65	48	49	58	54
Nondoctorate-granting	28	20	14	25	24	32	24

*Some 1994–95 values have been revised from the 1996 report.

SOURCE: National Science Foundation/Division of Science Resources Studies, 1998 Survey of Scientific and Engineering Research Facilities at Colleges and Universities.

Table 4-6. Number of institutions starting science and engineering research facilities repair/renovation (R/R) projects costing more than $100,000 and whether repair/renovation was scheduled by institution type: 1996–97

Institution type	Number of institutions that scheduled R/R	Number of institutions that scheduled R/R and actually started R/R	Number of institutions that did not schedule R/R	Number of institutions that did not schedule R/R but started R/R
Total	191	151	193	64
Doctorate-granting	147	126	110	48
Top 100 in research expenditures	77	74	22	17
Other	70	52	88	31
Nondoctorate-granting	44	26	82	16

NOTE: Components may not sum to totals due to rounding. Includes only the 383 institutions that were in both the 1996 and 1998 samples.

SOURCE: National Science Foundation/Division of Science Resources Studies, 1996 and 1998 Surveys of Scientific and Engineering Research Facilities at Colleges and Universities.

It is also worth noting that 64 or 33 percent of institutions that had not scheduled repair/renovation projects for 1996 and 1997, did, in fact, start new projects in 1996 and 1997. Overall, 48 or 44 percent of doctorate-granting institutions began repair/renovation projects that were not reported as scheduled, with 17 or 77 percent of top 100 institutions doing so.

Fields in Which Repair/Renovation Projects Started

Since 1986–87 there has been some change in the proportion of institutions starting new repair/renovation projects costing over $100,000 in specific S&E fields (table 4-7). The proportion of institutions starting repair/renovation projects declined in two fields:

- In engineering, the proportion of institutions decreased from 42 to 35 percent; and
- In the medical sciences in medical schools, the proportion of institutions decreased from 54 to 41 percent.

The proportion of institutions starting repair/renovation projects increased in two fields:

- In the physical sciences, the proportion of institutions increased from 22 to 31 percent; and
- In the medical sciences outside medical schools, the proportion of institutions increased from 12 to 25 percent.

In four fields, the proportion of institutions starting repair/renovation projects increased from the last survey period:

- In the biological sciences outside medical schools, the proportion of institutions increased from 22 to 29 percent;
- In the physical sciences, the proportion of institutions increased from 24 to 31 percent;
- In the social sciences, the proportion of institutions increased from 7 to 12 percent; and
- In the medical sciences outside medical schools, the proportion of institutions increased from 16 to 25 percent.

In one field, the medical sciences in medical schools, the proportion declined from 57 to 41 percent.

The proportion of institutions scheduled to start new repair/renovation projects costing over $100,000 in 1998 and 1999 is expected to change over 1996–97 levels in four fields:

- In the biological sciences outside medical schools, the proportion of institutions is expected to decrease from 29 to 21 percent;
- In the physical sciences, the proportion of institutions is expected to decrease from 31 to 22 percent;

Table 4-7. Trends in the percentage of institutions starting projects to repair/renovate science and engineering research facilities by field: 1986–99

Field	1986–87	1988–89	1990–91	1992–93	1994–95[1]	1996–97	(scheduled) 1998–99
Total	56	48	47	45	45	52	46
Biological sciences—							
inside medical schools	45	41	46	39	47	51	33
outside medical schools	23	24	22	22	22	29	21
Physical sciences	22	23	22	22	24	31	22
Psychology	9	4	10	4	5	8	11
Social sciences	8	5	--[2]	5	7	12	12
Mathematics	8	8	4	2	3	3	3
Computer sciences	15	5	10	6	6	5	12
Earth, atmospheric, and							
ocean sciences	13	9	13	13	11	12	12
Engineering	42	37	24	30	29	35	28
Agricultural sciences	33	25	27	18	28	25	19
Medical sciences—							
inside medical schools	54	44	62	61	57	41	34
outside medical schools	12	12	22	16	16	25	21

[1] Some 1994–95 values have been revised since the 1996 report.

[2] Psychology and social sciences were not differentiated in the questionnaire item for the 1990–91 period.

NOTE: As used here, repair/renovation projects are limited to those with prorated costs of $100,000 or more for affected research space. Percentages are based on the number of institutions with existing research space or planned repair/renovation projects in a given field.

SOURCE: National Science Foundation/Division of Science Resources Studies, 1998 Survey of Scientific and Engineering Research Facilities at Colleges and Universities.

- In the biological sciences in medical schools, the proportion of institutions is expected to decrease from 51 to 33 percent; and
- In psychology, the proportion of institutions is expected to increase from 8 to 11 percent.

Funds Committed to S&E Research Facilities Repair/Renovation Projects in Different Fields

Five fields account for more than three quarters (76 percent) of the $1.3 billion committed to the repair/renovation of S&E research facilities by research-performing institutions in fiscal years 1996 and 1997; three of these fields are in the biomedical sciences:

- The physical sciences—research-performing institutions committed $244 million;
- Engineering—research-performing institutions committed $208 million;
- The biological sciences outside medical schools—research-performing institutions committed $200 million;
- The medical sciences in medical schools—research-performing institutions committed $196 million; and
- The biological sciences in medical schools—research-performing institutions committed $164 million (table 4-8).

The amount of funds committed to new repair/renovation projects increased in three fields since 1986–87:

- In the physical sciences, funds increased from $139 million to $244 million (a 76-percent increase);
- In the earth, atmospheric, and ocean sciences, funds increased from $27 million to $52 million (a 93-percent increase); and

Table 4-8. Trends in funds committed to repair/renovate science and engineering research facilities for projects costing over $100,000 by field: 1986–99

Field	1986–87	1988–89	1990–91	1992–93	1994–95	1996–97	(scheduled) 1998–99
	In millions of constant 1997 dollars						
Total	1,108	1,243	982	955	1,116	1,325	1,580
Biological sciences—							
inside medical schools	102	94	146	132	107	164	93
outside medical schools	193	155	160	123	134	200	280
Physical sciences	139	203	179	153	203	244	241
Psychology	18	14	37	12	30	65	33
Social sciences	47	11	-- *	12	42	40	124
Mathematics	5	14	6	2	6	5	51
Computer sciences	23	12	25	4	8	12	95
Earth, atmospheric, and							
ocean sciences	27	22	19	36	37	52	54
Engineering	186	445	97	158	158	208	198
Agricultural sciences	26	28	41	16	76	50	26
Medical sciences—							
inside medical schools	230	198	197	267	238	196	282
outside medical schools	69	30	62	32	62	76	77
Other sciences	40	20	6	8	13	11	24

* Psychology and social sciences were not differentiated in the 1990–91 survey.

NOTE: Components may not add to totals due to rounding. Current dollars have been adjusted to constant 1997 dollars using the Bureau of the Census' Composite Fixed-Weighted Price Index for Construction.

SOURCE: National Science Foundation/Division of Science Resources Studies, 1998 Survey of Scientific and Engineering Research Facilities at Colleges and Universities.

- In the biological sciences in medical schools, funds increased from $102 million to $164 million (a 61-percent increase).

At the same time, funds decreased by 48 percent in the computer sciences, from $23 million to $12 million, and by 15 percent in the medical sciences in medical schools, from $230 million to $196 million.

Since the last survey period, the amount of funds committed to the repair/renovation of S&E research facilities increased in four fields and decreased in one. Funds increased in the following fields:

- In the biological sciences outside medical schools, funds increased from $134 million to $200 million (a 49-percent increase);
- In the computer sciences, funds increased from $8 million to $12 million (a 50-percent increase);
- In the earth, atmospheric, and ocean sciences, funds increased from $37 million to $52 million (a 41-percent increase); and
- In engineering, funds increased from $158 million to $208 million (a 32-percent increase).

The medical sciences in medical schools was the only field to experience a decrease in repair/renovation funds since the last survey. Institutions' financial commitment to this field declined by 18 percent, from $238 million to $196 million.

In 1998 and 1999, funds committed to new repair/renovation projects are scheduled to increase over 1996–97 levels in five fields, with allocated funds expected to more than triple in three fields:

- In mathematics, funds are scheduled to increase from $5 million to $51 million (a 920-percent increase);
- In the computer sciences, funds are scheduled to increase from $12 million to $95 million (a 692-percent increase);
- In the social sciences, funds are scheduled to increase from $40 million to $124 million (a 210-percent increase);
- In the medical sciences in medical schools, funds are scheduled to increase from $196 million to $282 million (a 44-percent increase); and
- In the biological sciences outside medical schools, funds are scheduled to increase from $200 million to $280 million (a 40-percent increase).

At the same time, funds are expected to decrease in only one field, the biological sciences in medical schools. Institutions are scheduled to commit 43 percent fewer funds to this field in 1998 and 1999 than they did in 1996 and 1997 (a decrease from $164 million to $93 million).

Funds Committed to Nonfixed Equipment Costing Over $1 Million in Repair/Renovation Projects

In 1996 and 1997, nine doctorate-granting institutions (4 top 100 institutions and 5 other doctorate-granting institutions) committed a total of $30.9 million to nonfixed equipment costing $1 million or more in their new S&E repair/renovation projects. This is 63 percent more than they committed to nonfixed equipment costing over $1 million in their S&E construction projects (see table 3-9).

These repair/renovation commitments occurred in only six fields (biological sciences inside and outside medical schools, medical sciences inside and outside medical schools, the physical sciences and engineering).[23] These 1996 and 1997 commitments at the nine doctorate-granting institutions represent 62 percent of total repair/renovation commitments in these fields:

- In the biological sciences outside medical schools, the amount of funds committed by two institutions to nonfixed equipment costing over $1 million accounted for 80 percent of all repair/renovation commitments in this field;
- In the physical sciences, the amount of funds committed by two institutions to this type of equipment accounted for 38 percent of all repair/renovation commitments in this field;
- In engineering, the amount of funds committed by three institutions to this type of equipment accounted for 26 percent of all repair/renovation commitments in this field;
- In the medical sciences in medical schools, the amount of funds committed by three institutions to this type of equipment accounted for 45 percent of all repair/renovation commitments in this field;
- In the biological sciences in medical schools, the amount of funds committed by two institutions to this type of equipment accounted for 34 percent of all repair/renovation commitments in this field; and
- In the medical sciences outside medical schools, the amount of funds committed by one institution to this type of equipment accounted for 11 percent of all repair/renovation commitments in this field.

[23] Some institutions committed funds to nonfixed equipment costing over $1 million in more than one field.